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# Knowledge **FOR** Resilient so**CI**Ety

***REPORT ON APPLIED STUDENT CENTERED TEACHING SKILLS***  
***Faculty of Architecture, Civil Engineering and Geodesy***



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## *Student centered teaching skills*



The courses on **K-Force master study program**, University of Banja Luka, Faculty of Architecture, Civil Engineering and Geodesy, where the methodology for ***STUDENT CENTERED TEACHING SKILLS*** is applied:

1. Constructive Rules for Fire safety of Building
2. Assessment of Damaged Structures
3. Repair of Timber, Steel and Masonry structures
4. Aseismic Design and Construction



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## *Student centered teaching skills*



### 1. Constructive Rules for Fire safety of Building

Two course projects – case studies were defined

- Students were doing case studies in groups of 2
- Each group prepared the paper which is discussed with the teacher and colleagues
- The final grade for papers is the same for all group members
- Teachers provided the literature, theoretic basics and regular consultations



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## *Student centered teaching skills*



### 1. Constructive Rules for Fire safety of Building

Course projects:

- Fire risk determination on the example of residential/public building
  - 2 group projects
  - 2 students per group
  - Tasks:
    - Determination of the fire resistance of the structure
    - Determination physical and chemical properties of flammable materials
    - Recognition of technological processes and the dangers that accompany it
    - Fire risk determination calculation



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## *Student centered teaching skills*



### 1. Constructive Rules for Fire safety of Building

Course projects:

- Evacuation route determination on the example of residential/public building
  - 2 group projects
  - 2 students per group
  - Tasks:
    - Division of the facility into fire departments
    - Evacuation of persons from building – route determination
    - Evacuation time calculations

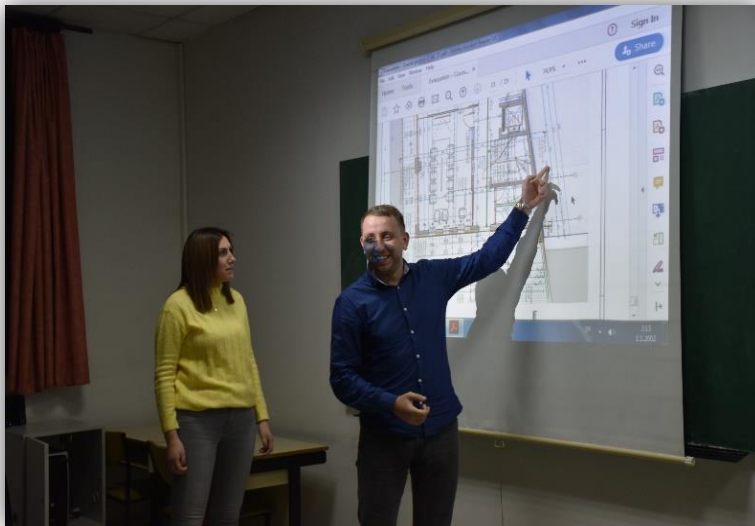


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Evacuation route determination on the example of residential/public building



*Evacuation route determination on the example of residential/public building – presentation of projects*



## Student centered teaching skills



### 1. Constructive Rules for Fire safety of Building

summary table

No	Student's name and surname	Title of paper/work	Type of work	Status of work
1.	Đorđe Vujić Dijana Topić	Evacuation route determination on the example of residential/public building	course project	completed
2.	Ana Ković Stevan Trivunović	Evacuation route determination on the example of public building	course project	completed
3.	Đorđe Vujić Ana Ković	Fire risk determination on the example of residential/public building	course project	completed
4.	Dijana Topić Stevan Trivunović	Fire risk determination on the example of public building	course project	work in progress



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## *Student centered teaching skills*



## **2. Assessment of Damaged Structures**

Three different class visits were organised

- Students were working in groups 2-5
- Each group performed activities on the site and they gain points in activity that affect the final grade
- Teachers provided theoretic basics, relevant standards and equipment for field tests
- Class visits and tasks were organized by the teachers



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## 2. Assessment of Damaged Structures

- Tasks:
  - Performing field visual inspection of the building - obtaining insight into the geometry of the building and the constructive system
  - Detections of defects
  - Making conclusions on defects causes
  - Familiarization with methods for damage identification
  - Familiarization with methods for built in materials condition assessment
  - Making conclusions of building state

*Student centered teaching skills*



## 2. Assessment of Damaged Structures

Class visits:

- **In-situ testing of concrete bridge over river Stavnja**
  - Assessment of concrete strength in construction - in situ concrete sampling, rebar detection, and rebound index determination



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## Student centered teaching skills

## Assessment of Damaged Structures



*In-situ testing of bridge structure over river Stavnja*



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*Student centered teaching skills*



## 2. Assessment of Damaged Structures

Class visits:

- **In-situ testing on concrete building in Banja Luka**
  - Demonstration of use of equipment for nondestructive and semidestructive testing in concrete - digital hammer, pull off adhesion tester, multi functional rebar detector



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## Student centered teaching skills

## Assessment of Damaged Structures



*In-situ testing on concrete building in Banja Luka*



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## *Student centered teaching skills*



## 2. Assessment of Damaged Structures

Class visits:

- **In-situ testing on steel crane structure in „Incel“ business zone**
  - Demonstration of nondestructive methods in use for assesment of steel structures (visual and dimensional inspection of elements and joints, liquid penetrant testing, magnetic testing, ultrasound testing)



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## Student centered teaching skills

## Assessment of Damaged Structures



*In-situ testing on steel crane structure in „Incel“ business zone in Banja Luka*



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## Student centered teaching skills



## 2. Assessment of Damaged Structures

summary table

No	Student's name and surname	Title of paper/work	Type of work	Status of work
1.	Draženka Radić, Đorđe Vujić, Ana Ković	In-situ testing of bridge structure over river Stavnja	group work – class visit	completed
2.	Class visit	In-situ testing on concrete building in Banja Luka	group work – class visit	completed
3.	Class visit	In-situ testing on crane structure in „Incel“ buisnis zone in Banja Luka	group work – class visit	completed



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## *Student centered teaching skills*



### 3. Repair of Timber, Steel and Masonry structures

One class visit was organised

One course project – case studie was defined

- Students were working in groups 4-5
- Each group prepared the paper and the presentation will is to be discussed with other students and teachers
- The final grade is the same for all the group members
- Teachers provide literature, theoretic basics and regular consultations



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## *Student centered teaching skills*



### 3. Repair of Timber, Steel and Masonry structures

Class visit:

- **Banjaluca's cultural center building façade repair**
  - Demonstration of repair techniques for masonry architectural heritage buildings



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## Student centered teaching skills

## Repair of Timber, Steel and Masonry structures



Site visit –

*Banja Luka's cultural center building - façade repair*



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## *Student centered teaching skills*



### 3. Repair of Timber, Steel and Masonry structures

Course project:

- Projects were assigned with following topics regarding assessment and repair on examples:
  - Protecting the architectural heritage of the Kastel fortress
  - Repair procedures on the example of a steel crane
  - Proposal for the repair of the steel part of bridge structure in Ilijaš municipality
  - Proposal for the repair of steel structure in Incel industrial zone, Banja Luka
  - Proposal for the repair of masonry building “Tereza” at the University Campus, Banja Luka
  - Proposal for the repair of concrete building of AGGF at the University Campus, Banja Luka



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### 3. Repair of Timber, Steel and Masonry structures

- Tasks:
  - Familiarisation with relevant valid standards
  - Describing the main defects and main causes of defects
  - To perform basics calculations for elements capacity evaluation before and after the repair, if relevant
  - To provide repairing plans for entire building in form of drawings
  - To provide repairing details in form of drawings
  - Describing repairing technology
  - Defining quantities of repairing works

# Student centered teaching skills

# Repair of Timber, Steel and Masonry structures



Assessment and proposal  
for the repair on examples



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*Assessment and proposal for the repair on examples – presentation of projects*

## Student centered teaching skills



### 3. Repair of Timber, Steel and Masonry structures

summary table

No	Student's name and surname	Title of paper/work	Type of work	Status of work
1.	Class visit	Site visit – façade repair - Banjaluka's cultural center building	group work – class visit	completed
2.	Zorana Joksimović, Nevena Đurđević	Assessment and repair on examples - Protecting the architectural heritage of the Kastel fortress Repair procedures on the example of a steel crane	course project	completed
3.	Draženka Radić, Đorđe Vujić, Momirka Davić, Ana Ković	Assessment and proposal for the repair of the bridge structure in Ilijaš municipality	course project	completed
4.	Nemanja Topić, Srđan Pavlović, Dalibor Nikolić, Nikolina Radovanović, Željko Janičar	Assessment and proposal for the repair of steel structure in Incel industrial zone, Banja Luka	course project	In progress
5.	Milan Jeftenić, Stefan Trivunović, Dušan Dimitrijević, David Popadić, Milan Topić	Assessment and proposal for the repair of masonry building "Tereza" at the University Campus, Banja Luka	course project	In progress
6.	Branko Trivić, Mladen Šurlan, Dijana Topić, Marina Ljubičić, Milana Knežević	Assessment and proposal for the repair of concrete building of AGGF at the University Campus, Banja Luka	course project	In progress



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## *Student centered teaching skills*



### 4. Aseismic Design and Construction

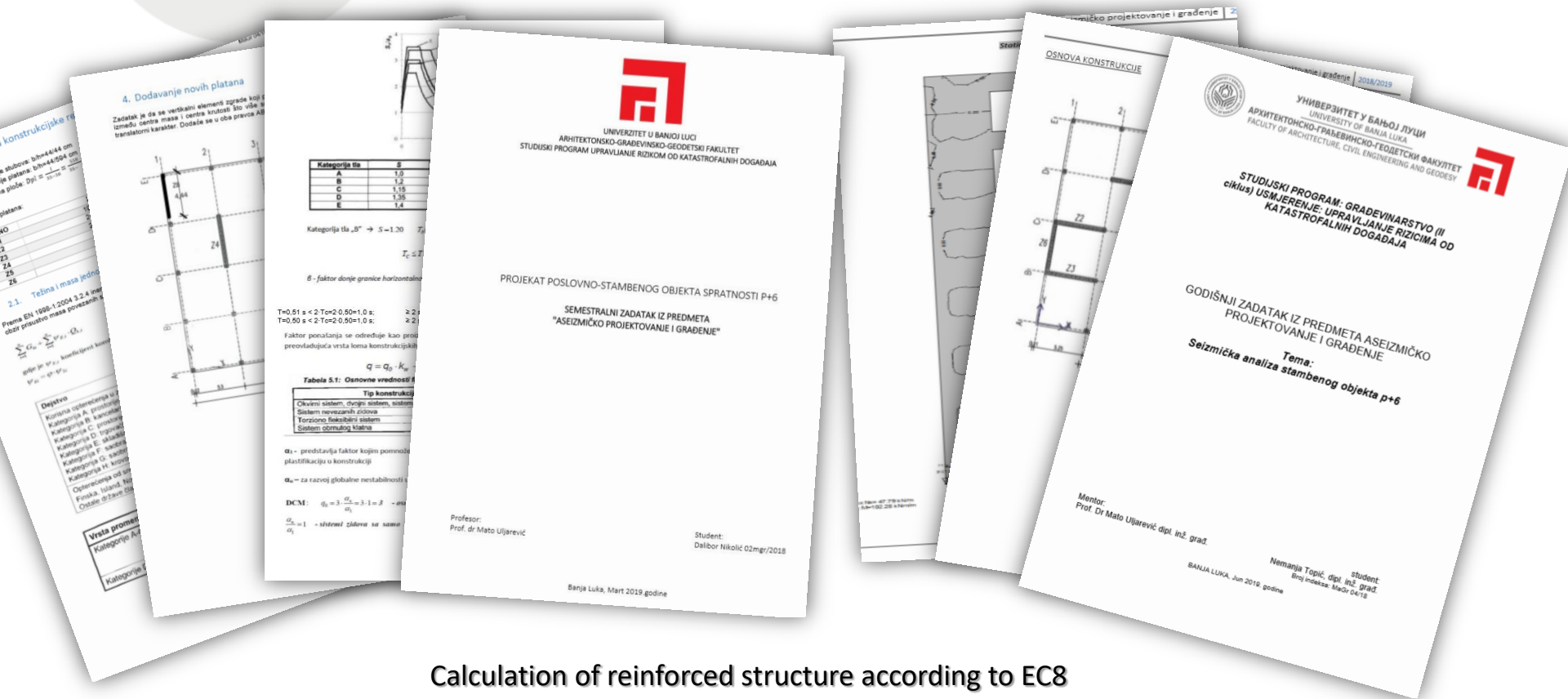
One course project – case studie was defined

- Teachers organised workshops, where students worked in groups and compared their results and different solutions for individual case studies
- Teachers provided the literature, theoretic basics and regular consultations
- Tasks:
  - Familiarisation with standard EC 8: Seismic Design of Buildings
  - Analysis and discussion of the structural regularity of the building
  - Comparing different input parameters and output results for individual cases



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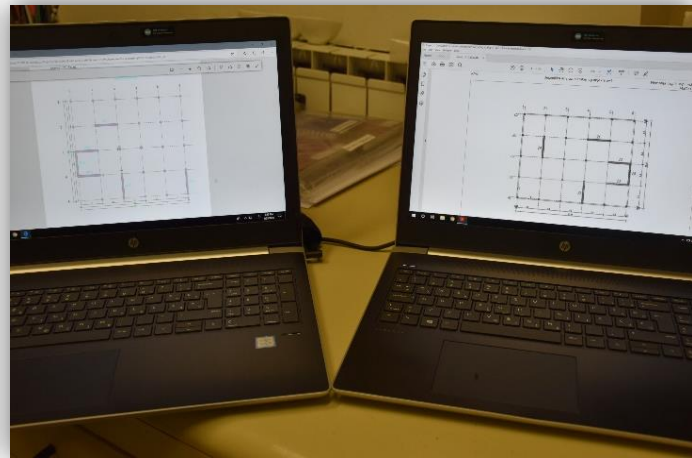




Calculation of reinforced structure according to EC8

## Student centered teaching skills

## Aseismic Design and Construction



Group exercises



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## Student centered teaching skills



### 4. Aseismic Design and Construction

summary table

No	Student's name and surname	Title of paper/work	Type of work	Status of work
1.	Nemanja Topić	Calculation of reinforced structure according to EC8	individual project	completed
2.	Dalibor Nikolić	Calculation of reinforced structure according to EC8	individual project	completed
3.	Branko Trivić	Calculation of reinforced structure according to EC8	individual project	in progress
4.	Mladen Šurlan	Calculation of reinforced structure according to EC8	individual project	in progress
5.	Dijana Topić	Calculation of reinforced structure according to EC8	individual project	in progress
6.	Đorđe Vujić	Calculation of reinforced structure according to EC8	individual project	in progress
7.	Momirka Davić	Calculation of reinforced structure according to EC8	individual project	in progress
8.	Ana Ković	Calculation of reinforced structure according to EC8	individual project	in progress
9.	Srđan Pavlović	Calculation of reinforced structure according to EC8	individual project	in progress
10.	Milan Jeftenić	Calculation of reinforced structure according to EC8	individual project	in progress
11.	Stefan Trivunović	Calculation of reinforced structure according to EC8	individual project	in progress
12.	Dušan Dimitrijević	Calculation of reinforced structure according to EC8	individual project	in progress
13.	David Popadić	Calculation of reinforced structure according to EC8	individual project	in progress
14.	Milan Topić	Calculation of reinforced structure according to EC8	individual project	in progress



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**THANK YOU FOR YOUR ATTENTION**

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